



Quantifying the environmental sustainability of stormwater management systems

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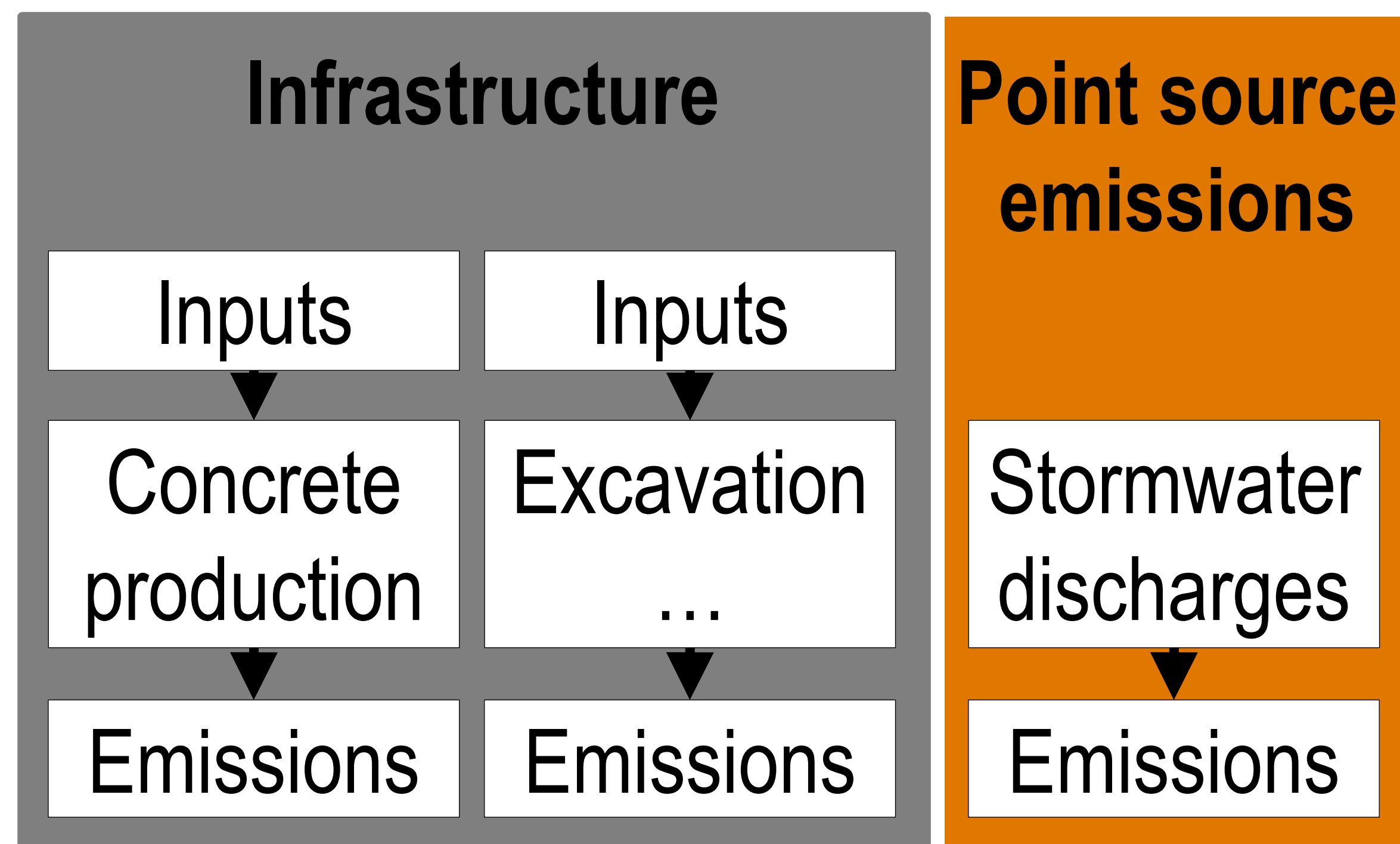
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Quantifying the environmental sustainability of stormwater management systems

Quantifier la durabilité environnementale des systèmes de gestion des eaux pluviales



Introduction

Stormwater management systems require inputs (materials, energy) and cause emissions through

- construction, operation and decommissioning of the physical **infrastructure** and
- **point source emissions** of polluted stormwater, leading to environmental damage.

Methods and materials

We used **life cycle assessment** to quantify the environmental damage caused by **four different stormwater management systems** dimensioned for a residential catchment of 260ha in Odense, Denmark.

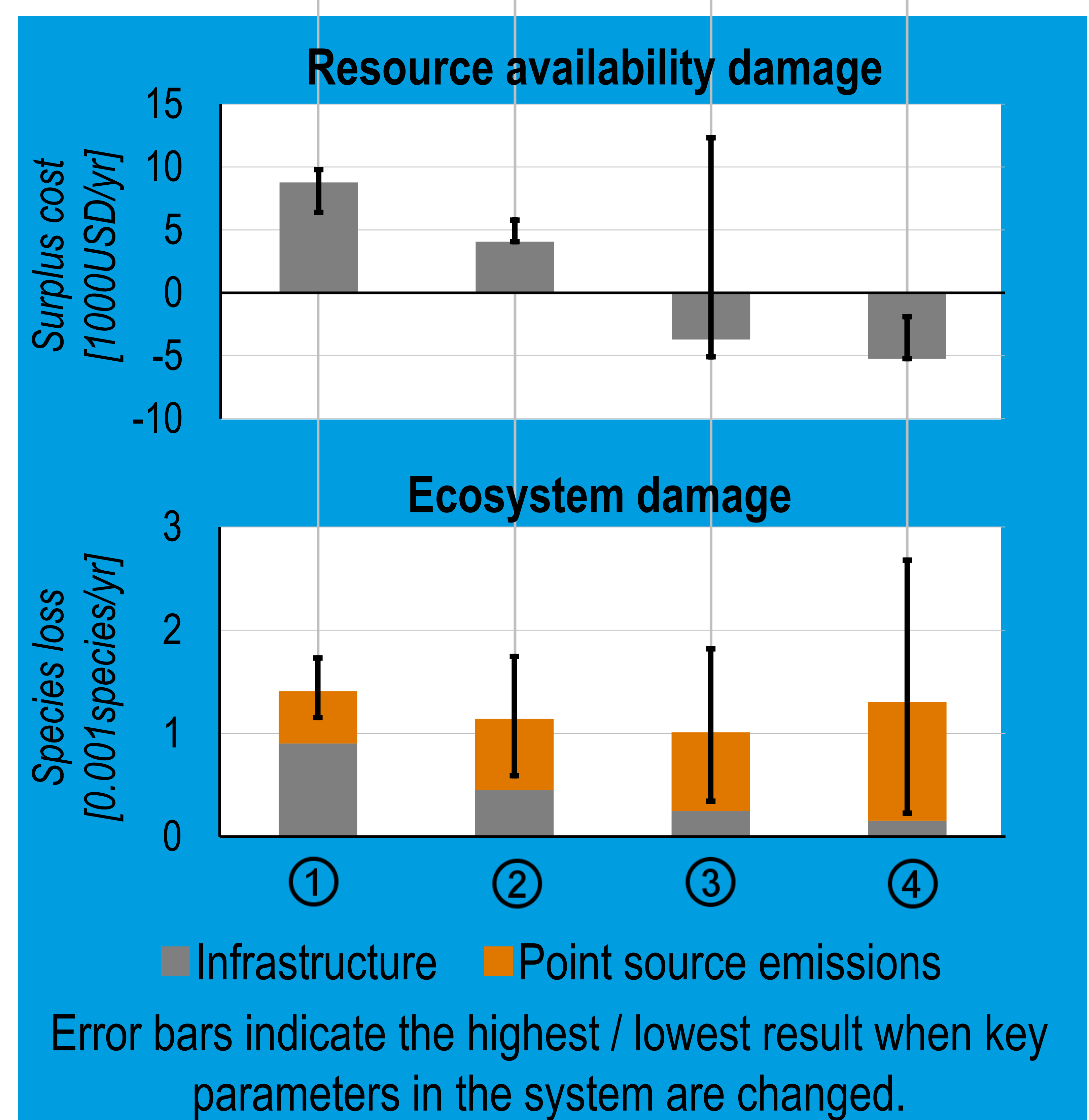
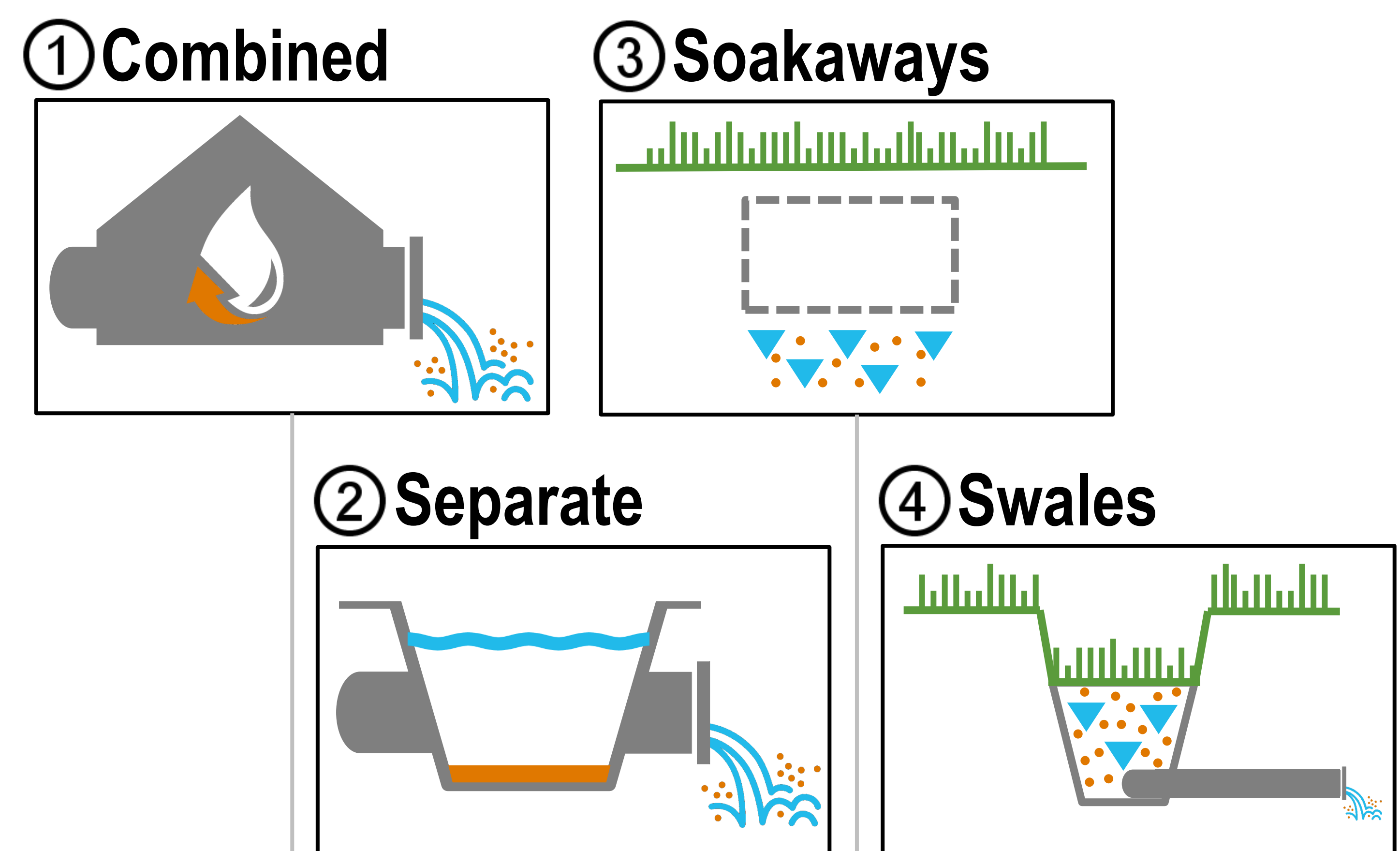
The assessment is based on a **comprehensive inventory** of all processes required over the life cycle of the different systems.

Results

The subsurface combined and separate systems cause high **resource availability damage**, mainly caused by **material demands** for pipes and basins. The green infrastructure based systems (soakaways and swales) even avoid damage because of **avoided road renewal** where swales and curb extensions are installed.

All systems cause similar **ecosystem damage**, which is mainly caused by discharges of **polluted stormwater**.

Changes regarding the assumed decommissioning processes and removal efficiencies affect the results significantly, highlighting the **potential to optimize** the sustainability in the planning process.



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